

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. International search report

The applicants respectfully request that an indication be made in the next Office communication that consideration has been made of all of the references listed in the International Search Report for WO 2003/103893 A3 (the international application of the pending application), a copy of which is indicated to have been received by the Office in paper M903 dated 01/12/2006 in the electronic file wrapper of the pending application. Such consideration is appropriate in view of MPEP § 1893.03(g).

2. In the claims

As shown in the foregoing LIST OF CURRENT CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

A. Claim amendment

Claim 32 is amended to clarify antecedent basis for the rotating tool. It is respectfully submitted that no new matter is added since the amendment merely corrects a minor informality.

Claim 59 is amended to recite that the rotating tool is positioned between the two bearings as helpfully suggested in the Office action. It is respectfully submitted that no new matter is added as the amendment merely corrects a minor informality.

Claims 1-31 remain canceled.

Claims 33-58 and 60-63 are left unchanged.

Entry of the LIST OF CURRENT CLAIMS is respectfully requested in the next Office communication.

B. Claim objection

Reconsideration and removal of the objection to claim 59 is respectfully requested, in view of the amendment to claim 59, on the basis that the minor informality has been corrected as discussed above.

Accordingly, removal of this objection is respectfully requested.

3. Rejection of claims 32-35, 43-49, and 58-60 under 35 U.S.C. § 102(b) as being anticipated by U.S. patent no. 5,795,139 (*Ikeda et al.*)

Reconsideration of this rejection is respectfully requested on the basis that the *Ikeda* patent fails to disclose each and every recited element of claims 32, 58, and 59. The remaining claims depend from either claim 32, or 59, and are therefore patentable as containing all of the recited elements of claims 32 or 59, as well as for their respective recited features.

Focusing initially on independent claim 32, an apparatus comprising a rotating tool is recited. Claim 32 further recites that the rotating tool is monolithic with a shaft. This recitation of “monolithic” is defined in the specification as originally filed on page 3, lines 9-16. Specifically, “monolithic” is a term of art recognized by a skilled artisan in this field of technology to mean an element either made out of one piece of material or out of elements joined to each other so as to be effectively made out of one piece of material.

This is explained in detail on page 3, lines 9-16 of the specification as originally filed. In particular it is explained that “the shaft-disc combination is fabricated as one whole, in a suitable way so as to withstand the high stresses that are induced by centrifugal forces upon rotation, and that it is not practical to dismantle them after fabrication.” Thus, while the term “monolithic” does not require an element to be made from one piece of material, the resulting combination after the joining of elements is that the end product is effectively made out of one piece of material. Such a definition of “monolithic” requires more than the standard mounting of one element onto another.

Turning to the *Ikeda* patent, a swash plate type compressor for refrigerant is disclosed. The *Ikeda* patent discloses that the plate is mounted on the drive shaft to rotate with the drive shaft (col. 4, lines 12-14), and that the plate is fixedly mounted in a manner such that the plate rotates together with the drive shaft (col. 8, lines 60-64). However, nowhere in *Ikeda* patent is it disclosed that the plate and shaft are monolithic with one another. As discussed above, the term “monolithic” is a term of art and is recognized by those skilled in this area of technology to require more than the mere mounting of one element onto another.

Thus the recitation in claim 32 of a tool that is monolithic with a shaft, as discussed above in detail, is clearly different from the “mounting” of a plate onto a shaft as disclosed in the *Ikeda* patent.

Furthermore, the *Ikeda* patent describes refrigerant compressors which are known to rotate at relatively low speeds. For example, in col. 1, lines 46-49 in U.S. patent no. 4,420,986 (*Nakayama et al.*), which is directed to the same technological field (refrigerant compressors) as the *Ikeda* patent, it is explained that a plate such as the one described in the *Ikeda* patent would not exceed rotational speeds of 6000 rpm.

By contrast, the monolithic rotating tool of the present application rotates at speeds far in excess of this, the lowest being almost twice this speed at 10,000 rpm and the greatest being almost twenty times this speed at 100,000 rpm (page 5, lines 4-6 of the specification as originally filed).

This is why it is explained on page 1, lines 17-20, and page 2, lines 5-7 of the present application that the tools and shafts have to be made monolithic with one another in order to prevent bursting due to the centrifugal forces induced therein.

This configuration is quite different from the much slower paced refrigerant compressor described in the *Ikeda* patent, which does not require a plate and shaft that are constructed monolithically. It is therefore submitted that the *Ikeda* patent fails to disclose at least the feature of a rotating tool that is monolithic with a shaft, as required by pending claim 32.

Furthermore, the plate in the *Ikeda* patent is arranged at an inclined angle to the axis of the shaft. This is necessary for the refrigerant compressor to work, since the rotation of the inclined plate is translated into reciprocation of the pistons of the compressor. However, by utilizing an inclined plate, the manufacturing tolerances necessary to avoid instability during rotation are more exacting than for a tool arranged without inclination. Such instability would also be more likely at high rotational speeds. This inclination does not typically cause a problem for refrigerant compressors which operate at relatively low rotational speeds and without external forces, caused by work-pieces acting on them. However, this is an unacceptable configuration for the higher rotational speeds of the present apparatus, which in one embodiment, may be a grinding wheel and therefore will have external forces acting thereon, because balance and stability are essential for accurate and safe rotation at high speeds. This is further evidence that the apparatus described in the *Ikeda* patent is not designed for high rotational speeds and accordingly does not disclose or require a monolithically constructed shaft and plate or tool.

Accordingly, it is evident that the refrigerant compressor apparatus of the *Ikeda* patent is completely different from the embodiment of claim 32. It has a different purpose, it has a different arrangement and it has a different application, and it does not include a tool that is monolithic with a shaft as required by claim 32. Therefore, withdrawal of the rejection of claim 32 under 35 U.S.C. § 102(b) is respectfully requested.

With regard to independent claims 58 and 59, each of which recites a blade or tool that is monolithic with a shaft, the *Ikeda* patent similarly fails to disclose at least this feature, as discussed in detail above. Accordingly, withdrawal of the rejections of claims 58 and 59 under 35 U.S.C. § 102(b) is also respectfully requested.

Another feature of each of the independent claims 32, 58, and 59 is that the thrust bearings utilize the sides of the rotating tool/blade itself directly as a thrust and/or bearing surface. This feature is not disclosed in the *Ikeda* patent, which specifically requires that each thrust bearing includes a pair of annular ring members

that are arranged to be in face-to-face contact with one another when they are assembled between the swash plate and the front or rear blocks of the compressor (col. 10, lines 45-50). Thus, the ring members positioned next to the swash plate form a stationary bearing surface for the thrust bearings. This is clearly in contrast with the embodiments of claims 32, 58, and 59, which require that the thrust bearings utilize the sides of the rotating tool/blade itself as a thrust and/or bearing surface.

Further, since the stationary bearing surfaces also include grooves 46 to deliver lubricating oil to the thrust bearings, it would not have been obvious to a skilled artisan to remove the stationary bearing surfaces to utilize the sides of the swash plate as a bearing surface, since such a removal would destroy the lubrication function of the stationary bearing plates.

Accordingly, since the *Ikeda* patent fails to disclose or suggest thrust bearings that utilize the sides of the rotating tool/blade itself as a thrust and/or bearing surface, as required by pending claims 32, 58, and 59, withdrawal of this rejection is respectfully requested.

As mentioned above, applicants submit that independent claims 32 and 59 are patentable and therefore, claims 33-57, which depend from claim 32, and claims 60-63, which depend from claim 59 are also considered to be patentable as containing all of the elements of respective claims 32 and 59, as well as for their respective recited features.

4. Rejection of claims 36-42, 50-57, and 61-63 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 5,795,139 (*Ikeda et al.*)

Reconsideration of this rejection is respectfully requested on the basis that the rejection fails to establish a *prima facie* case of obviousness with respect to claims 36-42, 50-57, and 61-63.

As discussed above in detail, the *Ikeda* patent fails to disclose or suggest all of the features of independent claims 32 and 59, from which claims 36-42, 50-57, and 61-63 depend. Thus, since claims 36-42, 50-57, and 61-63 include all of the elements

of the respective claim from which they depend, the *Ikeda* patent fails to disclose or suggest every feature of claims 36-42, 50-57, and 61-63.

Further, with respect to claims 38-42, 56, 57, and 61-63, as acknowledged in the Office action on page 3, the *Ikeda* patent fails to disclose the rotating tool being a drum or cutter or containing magnets, an illumination source, a sensor, a high-speed cutting tool, or a high speed imaging tool.

The Office action asserts either that the use of these features is a matter of design choice or a matter of engineering expedient. However, as discussed above in detail, the *Ikeda* patent is drawn to a swash plate type refrigerant compressor and addresses the problems associated therewith. Since the problems associated with the swash plate type refrigerant compressor are vastly different from those associated with a rotating tool being a drum or cutter or containing magnets, an illumination source, a sensor, a high-speed cutting tool, or a high speed imaging tool, it would not be merely design choice or engineering expedience to provide these features to the swash plate type refrigerant compressor of the *Ikeda* patent. Thus, the taking of Official Notice is not appropriate in this instance, and evidentiary support for the proposed substitution and/or combination of features is respectfully requested in the next Office communication.

With respect to claims 50-55, again as discussed above, the rotational speeds that the swash plate type refrigerant compressor of the *Ikeda* patent operates at will be limited to speeds that are much less than those recited in claims 50-55. In fact, for the reasons discussed above, the swash plate type refrigerant compressor of the *Ikeda* patent will not be operable at the rotational and surface speeds recited in claims 50-55, since such speeds will create instability in the compressor and cause the compressor to seize, break, or otherwise cease to function.

Accordingly, in view of at least the above comments, a *prima facie* case of obviousness cannot be maintained, and withdrawal of this rejection is respectfully requested.

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5. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicants' attorney, the examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500
Facsimile: (703) 683-1080

Date: January 4, 2008

Respectfully submitted,

/Patrick M. Buechner, Reg. #57,504/

PATRICK M. BUECHNER
Attorney for Applicants
Registration No. 57,504